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Modern Problems: Occupational Safety and Health in the 21st Century

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Outline

- Current problems
- Emerging issues
- New control approaches
- Opportunities for impact

Current exposures

- Lead
- Asbestos
- Silica
- Formaldehyde
- Noise
- Mold

Emerging exposures

- Infectious agents
  - SARS
  - Avian Flu
- Nano-materials

Gauley River

Workplace Safety and Health

Stone Cutting - 1955 (with water spray dust control)

FIGURE 20. *Diamond cutting saw. Note water spray. (Courtesy of Smith, Whitcomb & Cook Co., 1955.)*

Jackhammer Drilling - 1936

FIGURE 12. *Jackhammer drilling without dust control. (About 1936.)*

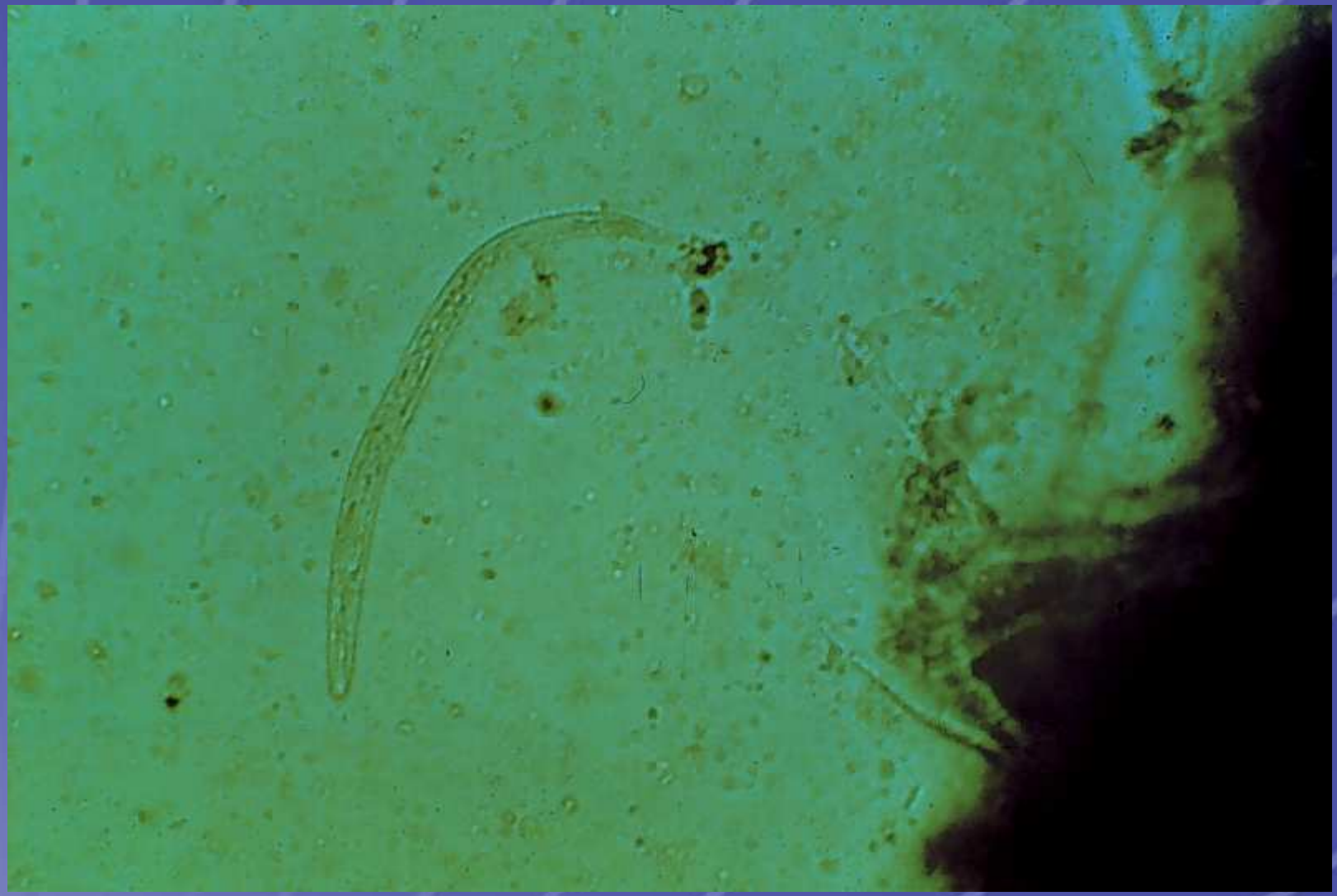
Stone Cutting ~1996 (no dust control)

Photo Credits: Ken Linch

Drilling in 1990's – 2000's

Photo Credits: Ken Linch & Joe Cocalis


US DOL
IT'S NOT JUST DUST
MSHA
IT'S SILICA



Mold in hurricane-damaged home

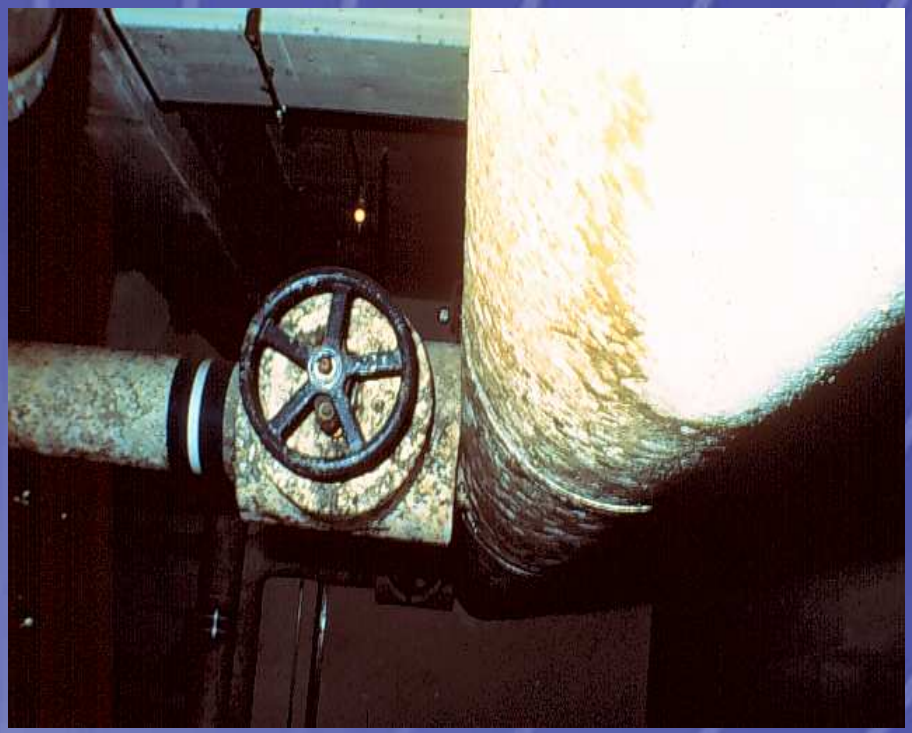
Photo Credits: Carol Rao

Leviticus 14:35

"He shall examine the disease; if the disease is in the walls of the house with greenish or reddish spots, and if it appears to be deeper than the surface, the priest shall go outside to the door of the house and shut up the house seven days. The priest shall come again on the seventh day and make an inspection; if the disease has spread in the walls of the house, the priest shall command that the stones in which the disease appears be taken out and thrown into an unclean place outside the city."

Circa 650 B.C.E.

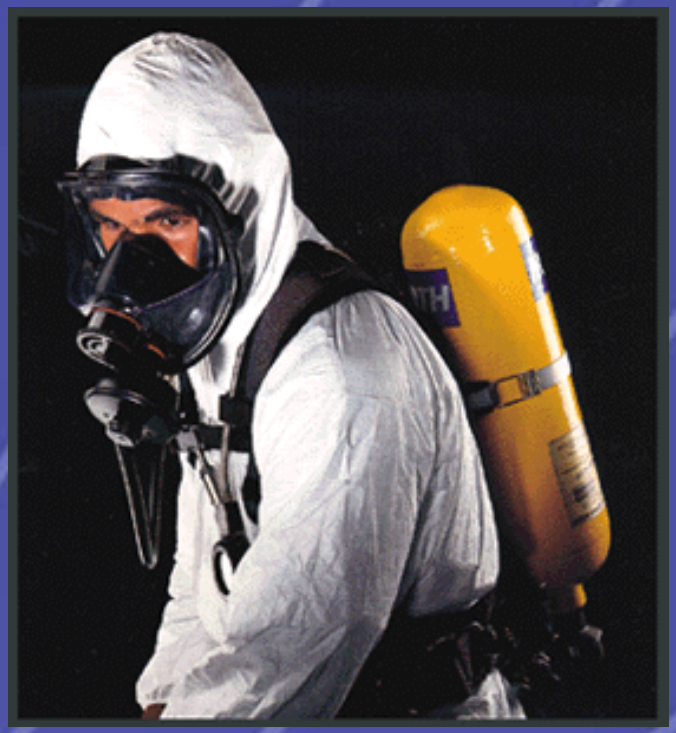
Mold in office building



Anthrax at Hart Senate Office Building


Kenneth Lambert / AP


EXPRE
MAI
PICK –



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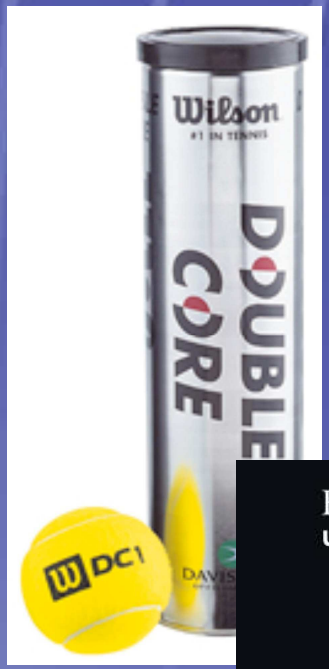
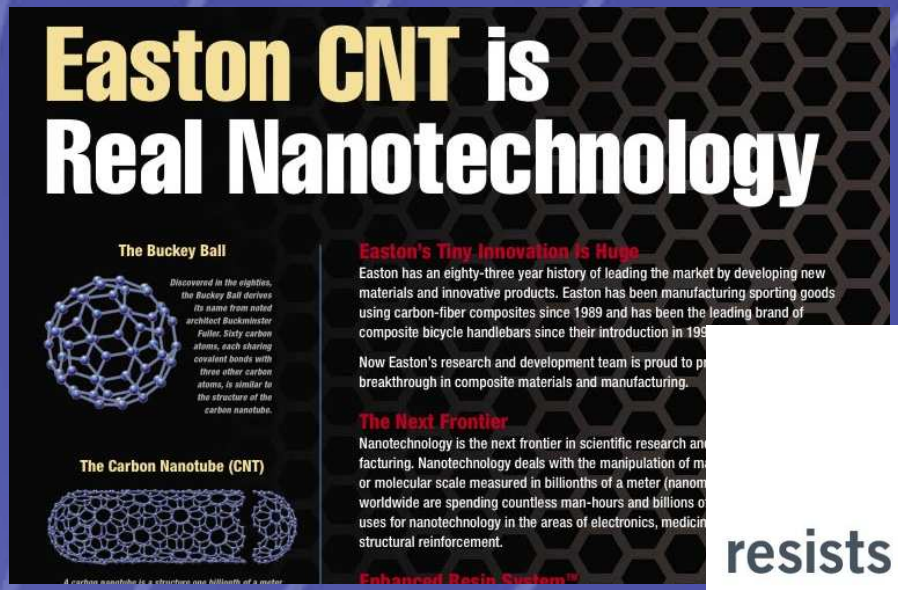
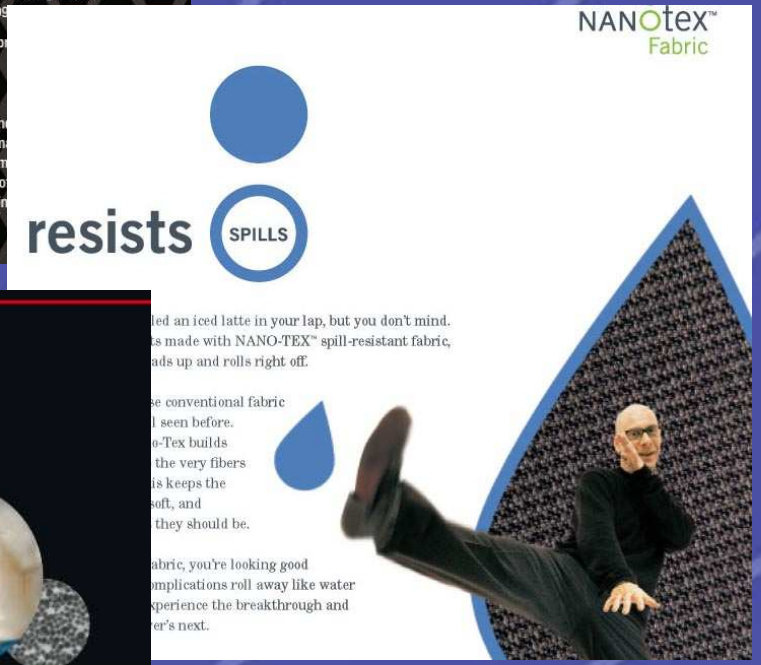
Nanotechnology in today's products

Nano clay composite





Carbon nano-tube composite



Nano fibers

Nano silica composite

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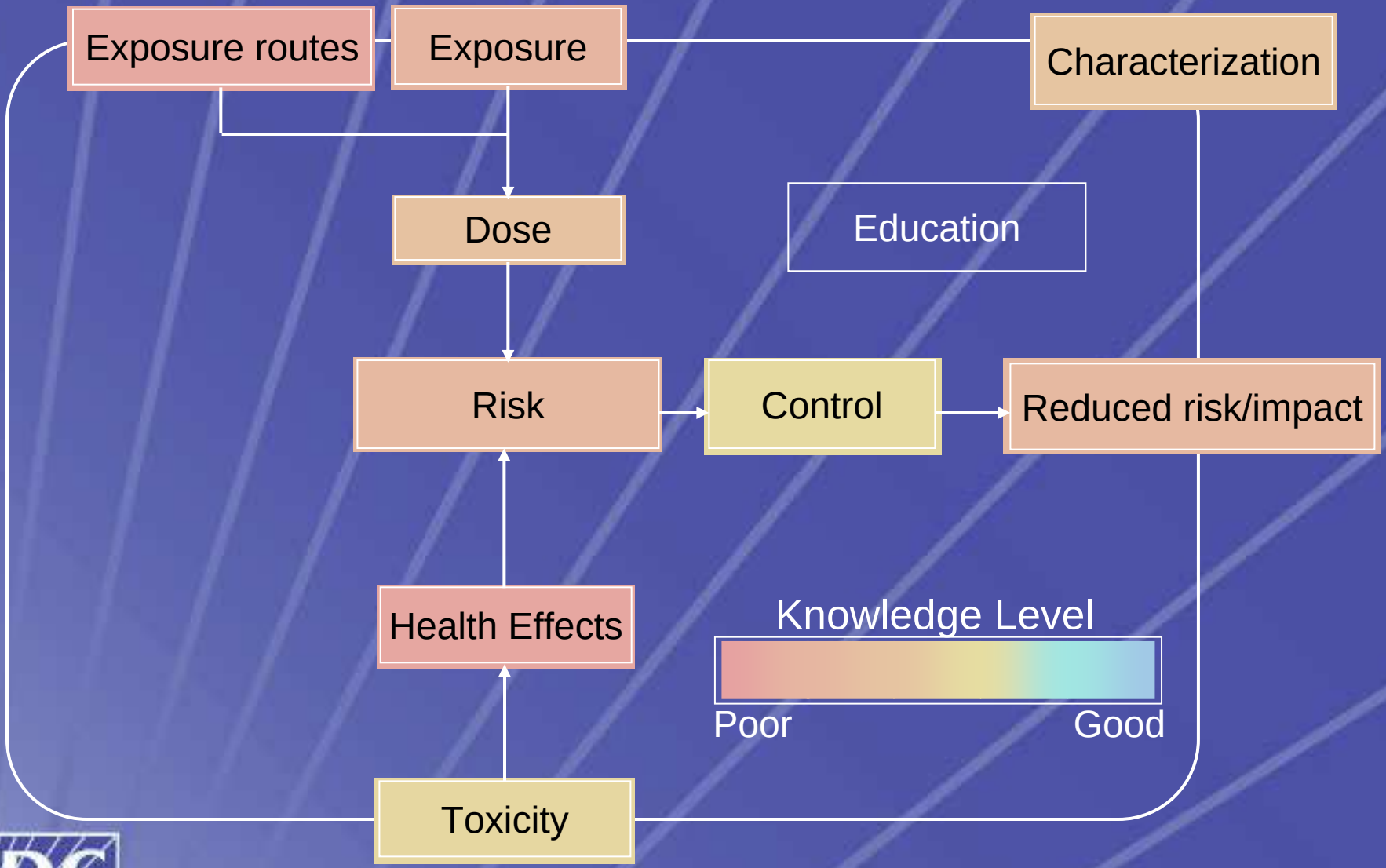
Workplace Safety and Health

Nanotechnology

- Are workers exposed?
- At what concentrations?
- Are there potential adverse health effects?
- What controls are available?
- How effective are they?

Addressing Occupational Impact



Workplace Safety and Health

Personal Dust Monitor

Control Banding

Table 1. Control bands for exposures to chemicals by inhalation

Band No.	Target Range of Exposure Concentration	Hazard group	Control
1	>1 to 10 mg/m^3 dust >50 to 500 ppm vapor	Skin and eye irritants	Use good industrial hygiene practice and general ventilation.
2	>0.1 to 1 mg/m^3 dust >5 to 50 ppm vapor	Harmful on single exposure	Use local exhaust ventilation.
3	>0.01 to 0.1 mg/m^3 dust >0.5 to 5 ppm vapor	Severely irritating and corrosive	Enclose the process.
4	<0.01 mg/m^3 dust <0.5 ppm vapor	Very toxic on single exposure, reproductive hazard, sensitizer*	Seek expert advice.

Summary

- Monitoring technology
- Analysis methods
- Exposure limits and guidelines
- Risk management tools
- Translate research to practice

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